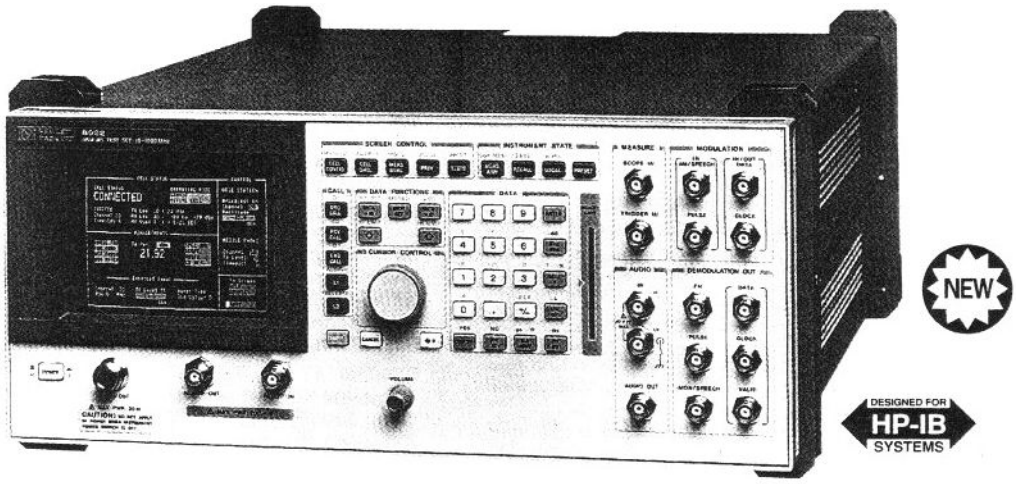
MOBILE/CELLULAR RADIO TEST SETS

GSM900 and DCS1800 Test Sets

HP 8922A, 8922B, 8922F, 8922H

- Complete GSM/DCS mobile station test sets
- Designed to minimize production/service costs
- Built-in toolkit of instruments
- Fast and easy to use
- Accurate and repeatable GSM measurements
- Built-in I-BASIC controller for easy automation



HP 8922H

HP 8922A/B/F/H GSM Test Sets

The HP 8922A, 8922B, 8922F, and 8922H are integrated test solutions for the production and servicing of GSM900 and DCS1800 radios. These test sets are based on a common, expandable platform. Hewlett-Packard is working on new test sets based on this platform to meet your expanding digital radio measurement needs. The HP 8922A is a tool box with the necessary hardware to test the RF characteristics of GSM modules. For base station testing, the HP 8922B builds on this platform by adding a large memory and reference section to provide baseband data patterns to control the built-in 0.3GMSK source. The HP 8922F is a standalone GSM mobile station tester. It includes a GSM base-station emulator and all the signaling capability to fully test a mobile without additional equipment. For manufacturing applications, the HP 8922H adds high-speed testing and additional flexibility to maximize production throughput.

Minimize Production/Service Testing Costs

The HP 8922H is built for manufacturing, with accurate and repeatable measurements. it provides the minimum test times under HP-IB remote control. The HP 8922F is tailored to the demanding needs of incoming inspection and mobile repair. It has all the ingredients necessary to minimize the cost per phone, a rich set of features which balances fast testing with a built-in toolkit of instruments and automatic test software. Features are bound together with an intuitive menu-driven user-interface. Sharing a common RF measurement architecture, the HP 8922F/H guarantees consistent test results during each stage of a phone's life: minimizing the chances of good phones being rejected at incoming inspection, maximizing the quality of new and repaired phones. Both products are developed from the industry standard HP 8922G.

GSM Radio Test Solutions

The HP 8922 contains a complete set of instrumentation for testing the RF sections of GSM radios. In addition to the frequency agile 0.3 GMSK RF generator, the RF analyzer has an agile local oscillator, coherent data demodulator, pulse demodulator, FM demodulator, global method analyzer for phase and frequency error, synthesized spectrum analyzer, and pulsed power meter. The HP 8922B adds a large programmable RAM and phase-lock-loop timing generator for generating long GSM data patterns. The HP 8922F/H adds a bit-error-rate tester (BERT) for performing GSM receiver measurements, channel CODEC, and call control protocol to setup a phone call and maintain the link while performing measurements. Echo mode is facilitated by the voice CODEC for functional testing of a mobile, and the electrical man-machine interface (EMMI) is implemented for controlling the mobile and supporting the digital audio interface (DAI).

Complete Tool Set

Aside from their complete complement of GSM measurements the HP 8922 contains general-purpose tools useful for module test troubleshooting, and debugging activities. These tools include a digital oscilloscope, CW RF synthesizer, spectrum analyzer, CW RF frequency counter, CW and peak RF power meter, ac voltmeter, dc voltmeter, 1 kHz distortion/SINAD meter, audio frequency counter and synthesized audio source. The sum of these capabilities makes the HP 8922 an extraordinarily powerful tool for the manufacture installation and repair of GSM radio equipment.

NEW

HP 83212B GSM/DCS1800 Mobile Test Software

The HP 83212B is an easy-to-use software solution for automatic testing of GSM900 and DCS1800 mobile stations. Running on the HP 8922F/H's built-in I-BASIC controller, the HP 83212B offers a comprehensive set of tests ideal for incoming inspection and repair of GSM phones. Its flexibility and modularity allow you to select and change test sequences, test parameters, and pass/fail limits without programming expertise. Procedures can be simply saved on RAM cards and distributed to colleagues, guaranteeing consistent test methods. All test results are displayed on the screen and can be documented with hard-copy printouts when an external printer is added. Three levels of testing are available with the HP 83212B: manual mobile station troubleshooting, quick functional checkout, and full parametric testing. Automating your measurements provides repeatable results while allowing the user to test more mobile stations in less time. This increase in throughput lowers your testing cost.

NEW

HP 83220A/E DCS1800 Test Sets

The HP 83220A expands the capabilities of the HP 8922 test set family to comprehensively test DCS1800 radios across the band 1710 to 1880 MHz. All the features of the RF generator, RF analyzer, and general instrumentation of the HP 8922 are retained. For cost-effective mobile testing, the HP 83220E extends the range of the HP 8922F/H for DCS1800.

HP 8922A/B/F/H Specifications

RF Generator
Frequency Range: 10 MHz to 1000 MHz
Frequency Resolution: 1 Hz
Switching Speed: 577 μs
0.3 GMSK Modulation[1]: External clock and data
Pulse Modulation[1]: Normal and 30dB
Output Power: +7 to −127 dBm

RF Analyzer
Frequency Range: 10 MHz to 1000 MHz
Frequency Resolution: 1 Hz (100 kHz in hop mode)
Switching Speed: 577 μs
Coherent Data Demodulation[1]: 0.3 GMSK at 270.833 Kb/s, 1 timeslot/frame
Analog Demodulation[1]: FM and Pulse
Global Method: rms and peak phase error, frequency error
Amplitude Envelope: Rise, fall, and burst flatness over useful bits
Peak Transmitter Power: −10 dBm to +45 dBm (+4 dBm to 41 dBm on HP 8922F/H)
Output RF Spectrum Measurements[2]: Due to modulation and switching transients
CW Frequency Counter: 10 MHz to 1000 MHz

Spectrum Analyzer[2]
Frequency Range: 10 MHz to 1000 MHz
Frequency Accuracy and Stability: Same as timebase
Display Range: 80 dB
Other Features: External trigger, marker

Digital Oscilloscope
Frequency Range: 2 Hz to 50 kHz
Sweep Times: 10 μs to 100 ms in 1, 2, 5, 10 steps

Audio Analyzer
Frequency Range: 20 Hz to 400 kHz
AC Voltage Range: 0 to 30 V_{rms}
DC Voltage Range: 100 mV to 42 V
THD + Noise: 1 kHz ±5 Hz
SINAD: 1 kHz ±5 Hz

Audio Source
Frequency Range: DC to 25 kHz
Output Level Range: 0.1 mV_{rms} to 4 V_{rms}

Reference Oscillator
External Reference Input Frequency: 13, 10, 5, 2, or 1 MHz
External Reference Output: 10 and 13 MHz

Remote Programming
HP-IB: IEEE 488.2
RS-232: 300, 1200, 2400, 4800, 9600, and 19200 baud

Internal Programming
Programming Language: Hewlett-Packard Instrument BASIC
Program Storage: 32 KB to 512 KB external memory cards

General Specifications
Size: 426 mm W × 177 mm H × 574 mm D (16.75 in × 7 in × 23 in)
Weight: 32 kg (70 lb)
Operating Temperature: 0° to +55° C
Storage Temperature: −40° to +75° C
Power: 100, 120, 220, 240 Vac, 48 to 440 Hz, ±10% of line voltage

HP 8922B Additional Specifications

Data Buffer
Frame Control RAM: Memory for 102 unique GSM frames
Data RAM: 64 KB FIFO for active timeslot (load via GPIO)
Hop RAM: 32 KB for controlling HP 8922B frequency hopping

GSM Reference
External Reference Input Frequencies: 13, 10, 5, 2, 1 MHz, bit clock, or frame clock

HP 8922F/H Additional Specifications
Broadcast Channel Capability: BCCH + CCCH or BCCH + CCCH + SDCCH/4
Control Channels: BCCH + CCCH, BCCH + CCCH + SDCCH/4, SDCCH/8 (non-hopped), SACCH/FACCH
Traffic Channels: TCH/FS
Call Control Capabilities: BS originated call (FS), MS originated call (FS), MS camp on, BS call disconnect, MS call disconnect
Timing: Auto, manual, uplink-downlink offset measurement
Hopping: Cyclic only, two MA tables with offsets
Digital Audio Interface (DAI)[1]: Normal operation and test of acoustic devices and A/D & D/A
Electrical Man Machine Interface[1]: Control via HP-IB
Speech Encoding/Decoding: Full rate speech (FS)
Echo Mode: HP 8922F: 1 second delay
HP 8922H: user selectable delay, 0 to 5 seconds
Bit/Frame Error Rate Measurements: Class Ia, Ib, and II bits
MS Power Output Level Control: 0 to 15 with RF analyzer auto adjust
Measurement Coordination: Flexible control of burst and ARFCN
SACCH MEAS Results: RXLEV, RXQUAL, RXLEV, timing advance.

Ordering Information
HP 8922A GSM RF Test Set
HP 8922B GSM BS Test Set
HP 8922F GSM MS Service Test Set
HP 8922H GSM MS Test Set
HP 83212B GSM/DCS1800 Mobile Station Test Software
HP 83220A DCS1800 Test Set
HP 83220E DCS1800 MS Test Set

Options for HP 8922A, HP 8922B, HP 8922F and HP 8922H
Opt 001 High Stability Timebase
Opt 002 Transit Protection (front panel cover, accessory pouch, and extended rear feet)
Opt W30 Extended Repair Service
Options for HP 8922A and HP 8922B
Opt 910 Provides a total of two sets of Operation Manuals and Service Manuals
Opt 913 Rack Mount Flange Kit
Opt 915 Adds Service Manual
Options for HP 8922F and HP 8922H
Opt 003 Protocol Logging (with HP 37900D) — HP 8922H only
Opt 006 Spectrum Analyzer
Opt 007 GSM900 Test SIM Card
Opt 008 GSM900 Test Micro SIM Card
Opt 012 GSM/DCS1800 MS Test Software (HP 83212B)
Options for HP 83220A/E and HP 8922F/H
Opt 0B1 Provides a total of two sets of Users Guides and Service Manuals
Opt AX4 Rack Mount Flange Kit
Opt 0B3 Adds Service Manual

[1]Not applicable to HP 8922F.
[2]Requires Option 006, Spectrum Analyzer, on HP 8922F/H.